PATENT SPECIFICATION

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No. 5464/35.

COMPLETE SPECIFICATION

Improvements in Carburettors for Internal Combustion Engines

I, RICHARD ARNOLD, of 6, Schlossstrasse, Dresden-A., Germany, of German nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The invention relates to a floatless downdraft or descending stream carburettor for internal combustion engines. The carburettor has features which permit perfectly economical and safe operation under essentially better conditions than heretofore. For this purpose, the carburettor can be accurately adjusted as to air and fuel to the speed or load of the engine, and it possesses the added advantage of ensuring easy starting of the engine even on cold days. Special auxiliaries or devices are not required. Already during the first experiments the carburettor has shown good results.

The carburettor according to the invention belongs to the group of floatless carburettors operating on the descending stream or downdraft principle, in which both the air passage and the fuel passage are each controlled by a regulating member. In carburettors of this class it is necessary to provide for the passage of the air in such a way that good turbulence and thus complete atomisation of the fuel are ensured. This is attained according to the invention by providing in the air passage of the carburettor an air conducting member which divides the air stream into several separate currents and guides them towards the fuel jet, the arrangement being such that the outer air currents are deflected and strike the middle currents so as to cause the formation of eddies around the fuel jet whereby the fuel is atomised completely. Besides the air conducting member, a mixture forming member is provided around the fuel jet, which is struck by the outer air currents of the air conducting member, so that turbulence is effected and, simultaneously, the outer air currents are guided towards the fuel inlet point.

The air conducting member is preferably adjustable and fixable as to height in the air passage, whereby different effects may be produced. The air conducting member possesses inside, in the direction of the passing air, individual air passages or ducts which may have a larger cross section towards the outer circumference of the conducting member than near the centre of the conducting member so that the outer air currents will pass more quickly through the conducting member. Furthermore, to ensure good passage of the air the inlet and outlet points of the air conducting member have curved surfaces, the former being concave and the latter convex.

The outer air currents, as stated, may be deflected by the venturi-tube surrounding the fuel jet, with or without deflecting surfaces disposed inside the air conducting member.

For idling, an inlet opening passing through the mixture former is provided behind the main fuel jet.

The air and fuel passages are preferably controlled by a common operating member.

The invention, which permits of still other concrete embodiments, is diagrammatically illustrated in the accompanying drawing, in which

Figure 1 is a vertical section of the carburettor;

Figure 2 a side view thereof, and

Figure 3 a top view thereof.

1 is the body of the carburettor with the air passage 2 and the throttle 3 for the air passage. 4 is the main fuel inlet opening controlled by a nozzle whose outlet opening 5 can be differently adjusted by a rugulating member 6 adjustable from without. The fuel enters the body of the carburettor through the connecting 7 and passes through the duct 8 to the space 9 or through a by pass 10 to an inlet point 11 with passes through the body of the carburettor to the inside of the latter. The opening is therefore located behind the main fuel jet 4. Above the space 9 a connecting member 12 is provided which is actuated by a spring 13 and capable of opening the passage 14 leading to the main fuel jet 4 more or less or closing it completely. The regulating member 12 is secured to the shaft 15 controlled by a

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cam 16 on the shaft 17 of the throttle valve 3.18 is the common operating lever for the throttle valve 3 and the cam 16.

Inside the air passage 2 the air conducting member 19 according to the invention is disposed and has a cylindrical circumference corresponding to that of the inside of the passage 2. It possesses openings 20 extending in the direction of the air passage, the inner bores 20 having a smaller cross section than the outer bores 21, so that the air can pass more quickly at the outer circumference than in the centre. Below the air conducting member 19 a mixture former 22 is arranged which surrounds the main fuel jet 4 on all sides and in its top, with the inclined surface 23, forms a deflecting surface for the air flowing through the bore 21. The deflecting surface may be inclined or angular or rounded, and serves also for guiding the air to the main fuel jet 4.

The device functions as follows:

The fuel enters at the opening 7 and passes through the bore 8, the space 9 and the valve 12 to the fuel jet 4. During idling the fuel passes through the pass 10 and the bore 11 and through the mixture former.

When the throttle valve 3 is opened, the air passes through the bores 20, 21. The air currents coming through the bores 21 and striking the inclined surface 23 are deflected towards the central air currents, and considerable eddies are formed near the fuel inlet jet 4, so that the fuel is thoroughly atomised. The mixture then passes to the engine in the direction of the arrows.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A carburettor provided with a fuel regulating valve controlled in dependance upon the air throttle characterised by a tubular air conducting member disposed between the air throttle and the atomiser nozzle extending into the suction pipe for dividing the air into a plurality of individual currents, the said tubular air conducting member having curved inlet and outlet surfaces and passages in the axial direction of the suction pipe concentrically arranged and a deflecting surface provided behind the air conducting member for guiding the outer individual air currents towards the centre of the suction pipe.

2. A carburettor according to claim 1, characterised in that the venturi tube surrounding the fuel jet serves as deflecting surface.

3. A carburettor according to claim 1, characterised in that the outer individual air currents are deflected by means of deflecting surfaces disposed inside the air conducting member.

4. A carburettor according to claim 1 characterised in that the air conducting member in the air passage is adjustably fixed as to its distance from the venturi tube.

5. A carburettor according to claim 1 characterised in that the air passages disposed towards the outer circumference of the air conducting member have a larger cross section than the air passage near the centre of the air conducting member.

6. A carburettor according to claim 1 characterised in that the fuel supply is separately regulatable.

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Fig. 1

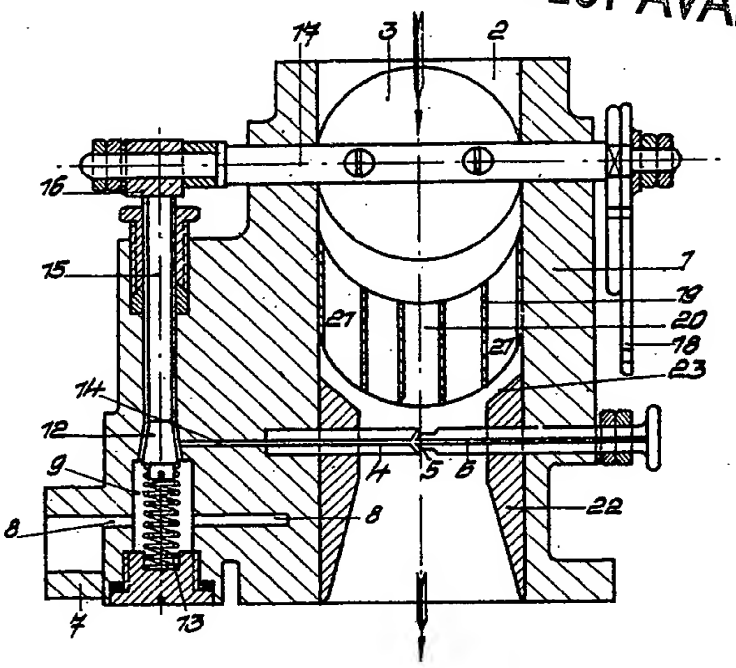


Fig. 2

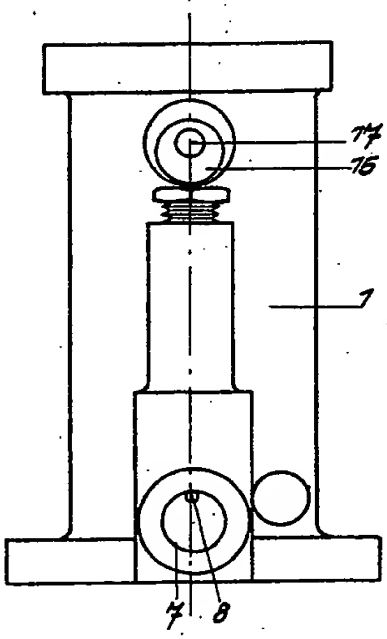
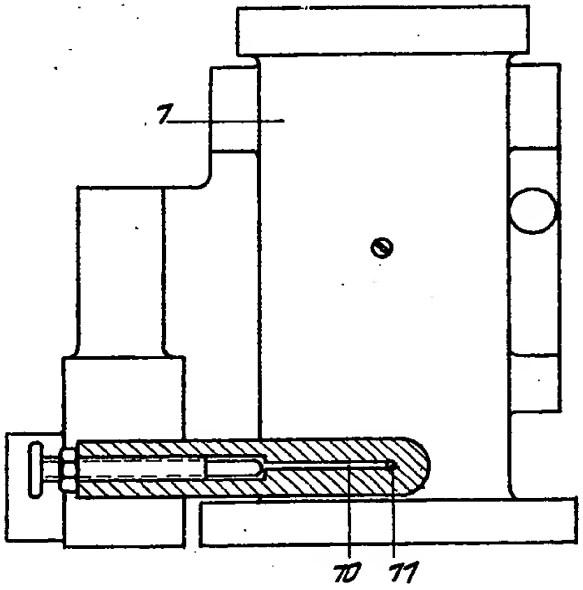


Fig. 3



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